Examination of a Recently Developed Epibenthic Index for New Jersey Estuaries

Marguerite Pelletier
Research Biologist
U.S. EPA Office of Research and Development (ORD)/National Health and Environmental Effects Research Laboratory (NHEERL)-Atlantic Ecology Division (AED)
(401) 782-3131
pelletier.peg@epa.gov

Authors: Marguerite Pelletier[1], James Kurtenbach[2]
[1]U.S. EPA ORD/NHEERL-Atlantic Ecology Division, Narragansett, RI
[2]U.S. EPA Region 2, Edison, NJ
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An epifaunal index was recently developed by TetraTech in concert with Region 2 for New Jersey estuaries (138 sites) in order to add an inexpensive biological indicator that improves the capability of their water quality monitoring program. Sampling of benthic infauna, the current standard estuarine monitoring technique, is costly and time-consuming. In contrast, epibenthos can be collected and enumerated quickly and cheaply. Initial analysis indicated that this index related well to land use gradients from Raritan Bay (more developed) south to Great Bay (less developed). To further examine the applicability of this index, Region 2 partnered with the ORD (NHEERL-AED) to examine this index more closely and compare it to infaunal data. Regional Applied Research Effort (RARE) funding was used primarily to provide taxonomic identification of the infaunal sampling and some support for Geographic Information System (GIS) mapping. The AED analyzed the data in consultation with Region 2. Epibenthic results were compared with infaunal samples collected at the same time in slightly deeper water (2–3 m) to determine whether results were comparable. Both indexes were compared with historical "deep water" sites within each water body to evaluate whether these measures were correlated with existing monitoring results. Existing data (land use, historic sediment, water chemistry measures) were collated and summarized by small watershed (11-digit HUC) to develop models to determine which signals were most strongly related to the indices. The epibenthic index was significantly correlated with the infaunal indices, although the relationship was not very strong ($\rho \sim 0.35$). The epibenthic index is related to land use and some chemical measures. In contrast, the EMAP index (historical assessment endpoint) was not associated with land use when aggregated by small watershed. More data (REMAP data for Barnegat Bay, NY, HUCs) will be assembled to explain some of the variability in the data and validate the conclusions of this study. Examination of related indices and their relationship to various environmental variables is helpful to the States of New York and New Jersey, as well as Region 2, as they choose appropriate biomonitoring tools to assess their estuarine waters.